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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,815	06/24/2005	Manfred Banek	11885-00063-US	6388

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EXAMINER	
MENDEZ, ZULMARIAM	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,815	BANEK, MANFRED	
	Examiner	Art Unit	
	ZULMARIAM MENDEZ	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/24/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

3. 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-7, and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Townsend, (US Patent no. 4,795,540).

With regard to claims 1, 6 and 15, Townsend discloses an improved design of electrolytic reduction cell by improving the cathode collector bar design to obtain a more uniform current distribution across the cathode bottom (col. 3, lines 61-66) the design comprising carbon cathodes and collectors for the electrolytic production of aluminum (col. 3, line 67 to col. 4, line 3), wherein the cathode system is divided in the direction of its long axis on the side of the power conduction from the cathode to the collector into at least two parts having a differing electrical resistance (see figure 2; col. 5, lines 3-22

and 36-58) in such a way that the electrical resistance from the ends of the collector to the part of the cathode facing the collector at the ends of the cathode is higher than the electrical resistance from the ends of the collector to the part of the middle of the length of cathode facing the collector (col. 5, line 59 to col. 6, line 12), where the division of the cathode system into at least two parts of differing electrical resistance is achieved by dividing the collector in the direction of its long axis on the side of the power conduction to the cathode into at least two parts of differing electrical resistance (col. 5, lines 3-57; col. 6, lines 31-48). Even though Townsend fails to explicitly teach wherein the electrical resistance at the ends of the collector is at least 1.2 times the electrical resistance to the part of the middle of the length of the cathode facing the collector, Townsend discloses wherein the cathode collector bars are tightly attached to the cathode blocks with cast iron to enhance the electrical contact between the carbon cathode blocks and the cathode collector bars (col. 1, lines 28-31). Slots (12), filled with a refractory cement or other material which has a higher electrical resistance than the steel cathode collector bar (11) are formed in the cathode collector bar (11) and extend in a direction away from the center of the cathode collector bar, i.e. toward the nearest end of the cathode collector bar (11) connected to an external bus (41; col. 5, lines 3-20 and 36-58). Therefore, the electrical resistance at the ends of the collector will be higher than the resistance at the middle facing the cathode blocks in order to obtain a more uniform current distribution across the cathode bottom.

With regard to claim 2, Townsend discloses wherein at least two different contact compositions are used for establishing electrical contact between cathodes (21, 22, 25

and 26) and collectors (11; col. 5, lines 36-66), with the boundary between zones of different contact compositions running perpendicular to the long axis of the collectors (see figure 2), and the contact resistance between collector and cathode in the middle of the length of the cathode is lower than the contact resistance in the region of the ends of the cathode (col. 5, line 3 to col. 6, line 48).

With regard to claim 3, Townsend teaches wherein the contact composition in the region of the middle of the cathode length is cast iron (col. 5, lines 59-66).

With regard to claims 4, 5 and 13, Townsend discloses all of the features, as discussed above, wherein in the region of the middle of the cathodes is established by filling the join with cast iron but fails to explicitly disclose wherein the contact composition used in the region of the ends of the cathode length is selected from among tars, tar pitches, synthetic resins based on epoxy resins and/or phenolic resins and adhesives based on epoxy resins and/or phenolic resins filled with electrically conductive particles. However, Townsend does disclose wherein the cathode blocks (21, 22, 25 and 26) are separated by ram joints (40) which are made from calcined anthracite and coal tar pitch because the electrical resistivity of the baked ram joint is typically about five times that of the semi-graphitic cathode block material so that outward horizontal electrical currents in the cathode block ram joint structure are discouraged in favor of electrical current flowing downward into the collector bar (11; col. 6, lines 21-30) in order to further promote a uniform current distribution through the system. Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to contact the end of the cathode length with a composition of

coal tar pitches, as taught by Townsend in order to further promote a uniform current distribution through the system.

With regard to claim 7, Townsend discloses wherein the metallic material of the collector is uniform and the collector is divided into zones of differing cross section which are insulated from each other (col. 5, line 59 to col. 6, line 12 and lines 44-48).

With regard to claim 9, Townsend teaches wherein a zone of the collector (11) having a higher resistance is configured in the form of a plate (16) facing the cathode side (25; see figure 2).

With regard to claim 10, Townsend further discloses wherein a zone (16) of the collector (11) having a higher resistance is configured in the form of a sheath which completely covers the side facing the cathode (25) and the areas (16) of the collector (11) which are in physical contact with the cathode (25; see figure 4).

With regard to claim 11, Townsend teaches wherein the collector (11) is covered by a sheet-like insulator (35, 12) on the areas which face the cathode blocks (21, 22, 25 and 26) and consist of zones of differing resistance up to the point where the collector (11) establishes electrical contact (col. 5, lines 3-57; col. 6, lines 31-48).

With regard to claim 12, Townsend discloses introducing at least two contact compositions of differing electrical resistance (50, and material in slots 12 and 35) into the recess on the underside of the cathode blocks (21, 22, 25 and 26), with the electrical resistance of the contact composition in the zone facing the middle of the cathode blocks (21 and 22) being lower than that of the contact composition of the zone facing the end of the cathode blocks (25 and 26; col. 5, line 3 to col. 6, line 48).

With regard to claim 14, Townsend discloses wherein an angular metal bar is machined so as to remove material from the surface of at least one area facing the cathode and the resulting depression is covered in an electrically insulated fashion with a metal plate or metal sheath which is flush with the original dimension (col. 5, lines 36-58).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Townsend in view of Torvund (WO 02/42525).

With regard to claim 8, Townsend discloses all of the limitations, as applied to claim 6 above, but fails to explicitly teach wherein at least two different metals are used for constructing the collector.

Torvund discloses a device to conduct current to or from the electrodes wherein the current collector comprises three segments (2, 3, 4; see figure 1) where the inner segment is manufactured from steel, the intermediate segment is manufactured with a steel lining (8) over an inner core of a material (9) with better electrical and thermal conductivity than steel, and the outer segment is also manufactured from a material (9) with better electrical and thermal conductivity than steel in order to reduce electrical voltage drop, obtain a better electrical and thermal conductivity as well as better current distribution (page 5, lines 1-30; page 3, lines 27-31). Therefore, one having ordinary skill in the art at the time of the invention would have found it obvious to use a current collector manufactured with different materials, as taught by Torvund, in the system of Townsend, in order to reduce electrical voltage drop, obtain a better electrical and thermal conductivity as well as better current distribution.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Monday-Friday from 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa D. Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1795

/Z. M./
Examiner, Art Unit 1795